Eighteenth Street Bridge
St. Louis
Missouri

HAER No. MO-10

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
DEPARTMENT OF THE INTERIOR
P.O. BOX 25287
DENVER, COLORADO 80225

HISTORIC AMERICAN ENGINEERING RECORD
EIGHTEENTH STREET BRIDGE

LOCATION: Spanning Missouri-Pacific, Amtrak, and Terminal Railroad Association tracks at Eighteenth Street between Austin Street and Clark Avenue, St. Louis, Missouri
UTM: 15.743035.4278465
Quads: Cahokia and Granite City

DATE OF CONSTRUCTION: 1908-1910 (Superstructure)
1882 (Substructure)

PRESENT OWNER: City of St. Louis
City Hall
St. Louis, Missouri 63103

PRESENT USE: Bridge was closed to vehicular traffic on June 20, 1983, but is still open to pedestrian traffic.

SIGNIFICANCE: The Eighteenth Street Bridge is a 1,054-foot-long through-truss and through-plate girder structure with distinctive ornamentation over each truss portal in the form of finials and cresting, and perforated trefoils in the bridge's spandrels. Punched holes in the cresting over the top of each portal spell out the words "Eighteenth Street."

HISTORIAN: Sverdrup & Parcel and Associates,
January 1984

OVERVIEW

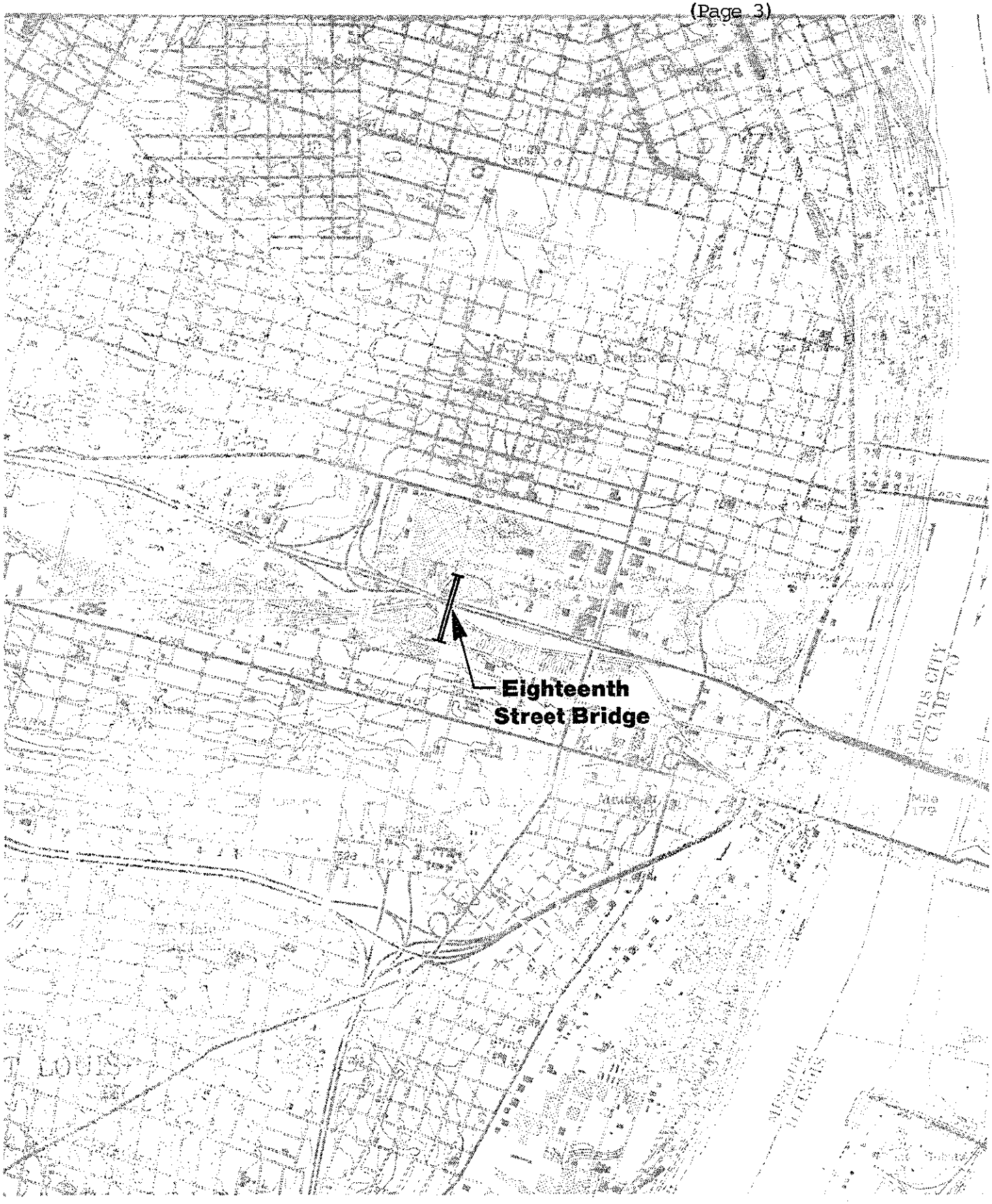
The Eighteenth Street Bridge is located at the southwest edge of the St. Louis Central Business District about 1,000 feet south of St. Louis Union Station. The bridge carries Eighteenth Street over the broad, shallow Mill Creek Valley and 20 tracks of the Terminal Railroad Association, Missouri Pacific, and Amtrak railroads. The bridge provides an important north-south connection over the extensive east-west trending industrial/rail corridor that tends to divide St. Louis into north and south sectors. The attached map shows the bridge in its regional context.

The City of St. Louis, under the Federal Highway Administration's Federal Aid Urban Program, is to replace the bridge due to its structural deterioration and projected traffic growth that will exceed the bridge's roadway capacity. The existing bridge will be demolished and replaced with a new four-lane structure on the same alignment. Demolition of the old bridge will be in late 1984 and the new bridge will be open to traffic in late 1985.

PROJECT HISTORY

The area in the vicinity of the Eighteenth Street Bridge has long been urbanized; country homes began appearing as early as the 1820's according to the St. Louis City Plan Commission. In 1849 when the St. Louis city limits were fixed at Eighteenth Street, residential development was gradually intensifying, although the city's urbanized area, spatially and commercially, was still oriented toward the river.

During the period 1840-1880, when St. Louis underwent a major expansion in area and growth in population, the Eighteenth Street Bridge area gradually changed in character from predominately residential to an industrial/commercial area drawing on its close proximity to developing railroads and central business district activities. By 1860 the city's developed area had enveloped the Eighteenth Street vicinity. The opening of the Eads Bridge across the Mississippi River and construction of an accompanying railroad tunnel beneath the central business district to points west evidenced the decline of the city's dependence on steamboat traffic and the growing significance of the railroad to the



18th St. Bridge
Regional Setting

city's economic health. Because of the gentle grades afforded by the Mill Creek Valley and its extensive character, the stream valley became an avenue for railroads to and from the Eads Bridge crossing, and thus an area of industrial development. As rail traffic increased, congestion and delay were increased at the north-south, at-grade street crossings along this rail corridor. It became clear that orderly urban and economic development could not be maintained without a rationalization of the city's street and railroad network in the form of grade separations. Accordingly, the rail corridor and street network between the Mississippi River and Grand Boulevard were largely grade separated in the last twenty-five years of the nineteenth century. Most streets were terminated at the rail/industrial corridor, but those of more than local transportation significance were bridged over the tracks. A Tucker Boulevard (Twelfth Street) grade separation was completed in 1875, Fourteenth Street in 1876, Twenty-First Street in 1892, and Jefferson Avenue in 1881. Mill Creek was placed in a large stone tunnel and routed along the south side of its valley.

The first Eighteenth Street Bridge was constructed in 1882. It was a cable-stayed/deck truss structure with masonry abutments and piers on the same alignment and of approximately the same length as the existing bridge. It supported a two-lane roadway, and may have contained trolley tracks as well, although this is not known. Design drawings for the existing bridge are the only source of data for the original structure, and these provide what little we know of it.

The existing bridge was designed in 1907 (engineer unknown) in the Office of the Bridge Engineer of the city's Street Department and built between 1908 and 1910 by the American Bridge Company. It is not known why the first bridge was demolished. More precisely, the superstructure was removed, but the piers and abutments were modified for reuse. Again, the design drawings (55 sheets) and an equal number of superstructure shop drawings are the only records available and these offer little clue as to the nature of the circumstances surrounding the design of the new bridge. There was no indication of structural problems with the old bridge, nor was there any suggestion that traffic

growth on the bridge necessitated a wider roadway and thus a new bridge. However, judging from the subsequent modifications made to the bridge piers, in the form of increased vertical clearance, it seems reasonable to speculate that changes in the amount and kind of railroad cars prompted a requirement for increased vertical clearance. The new bridge provided an additional 3 feet (from 19 to 22 feet) of vertical clearance for rail traffic. It should be remembered that St. Louis Union Station, bordering Eighteenth Street and just northwest of the bridge, was opened to traffic in 1896. The station's steel train shed was at the time the largest in the United States with space for over 32 tracks. Therefore, the construction of the new bridge could very well have occurred because of the substantial amount of new traffic, both vehicular and rail, generated by the station.

BRIDGE DESCRIPTION

Review of the design drawings reveals the following design details of the new bridge. The new bridge was a 1,054-foot-long structure consisting of a steel superstructure resting on a masonry and concrete substructure. The bridge design was typical of its era; the steel superstructure consisted of one pin-connected 218-foot, 4.5-inch through-truss and 13 through-plate girder spans of lengths varying from 32 to 82 feet.

The engineering firm of James B. Becker, Consulting Engineers, noted the following substructural conditions in a December, 1970 inspection report. The original masonry substructure units were modified by brick and reinforced concrete construction to accommodate increased vertical clearance. Two new concrete piers were constructed to support the new superstructure. The earth fill for the north and south approaches was retained by masonry abutments and retaining wall structures. The masonry retaining wall on the west side of the south approach was 166 feet long while the wall on the east side of the north approach was 279 feet long. The location of the south bridge abutment was the same as the original bridge's, but the north approach roadway was lengthened 76-1/2' by eliminating two deck truss spans.

The deck consisted of a 32-foot-wide roadway with cantilevered sidewalks on each side. It was constructed of a reinforced concrete slab supporting granite paving blocks that have since been covered by a thin asphalt surface. The deck supported both vehicular and streetcar traffic, the latter on double tracks.

While the bridge design was common for the time, it was given distinctive decorative features by the addition of perforated trefoils in the bridge's spandrels and cresting terminated with finials along the top of each portal. The words "Eighteenth Street" have been punched on the cresting across the top of each portal. The Missouri State Historic Preservation Officer has noted that this High Victorian flavor is particularly appropriate given the close proximity of St. Louis Union Station, a Romanesque Revival National Historic Landmark.

In addition, there were a number of design features, that while typical for the era, are no longer used in bridge design. These features include:

- Pin truss connections instead of bolted or welded construction (see Photos MO-10-6, 20, and 33).
- Turnbuckles as a mechanism by which the camber of the truss was adjusted (see Photo MO-10-6).
- Through plate girders that, while still widely used and not in and of themselves a poor design element, when coupled with an inadequate drainage system were a major cause for structural deterioration (see the James Becker inspection report) (see Photos MO-10-14, 16, 17, 21, 22 and 31).

The bridge has not undergone any major rehabilitation since its reconstruction, except for minor, as needed repairs. The streetcar tracks were abandoned some time after World War II and before 1960, and the tracks were covered with a thin layer of asphalt. Decorative street lamps along the outside edge of each sidewalk were removed in the early 1970's.

BIBLIOGRAPHY

Design Drawings (55 sheets) for the Reconstruction of the Eighteenth Bridge, various dates between 1906 and 1911, Office of the Engineer, Street Department, City of St. Louis.

Shop drawings for the Superstructure, American Bridge Company, 1909.

Inspection Report, Eighteenth Street Viaduct, City of St. Louis, James B. Becker Consulting Engineers, December, 1970.

Statement of Opinion of the State Historic Preservation Officer concerning the eligibility of a property for inclusion in the National Register.

Eighteenth Street Bridge Replacement over Missouri Pacific, Amtrak, and Terminal Railroad Association Tracks from Chouteau Avenue to Market Street, City of St. Louis, Missouri, Final Environmental Assessment, Federal Highway Administration, June, 1983.